



Unicla



**UWX440/550
Compressor
Service Manual**

440/550 Series Compressor Service Manual

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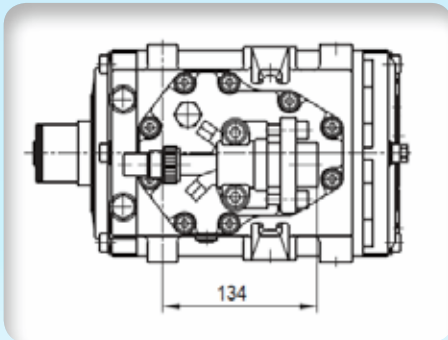
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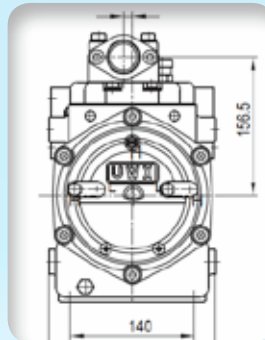
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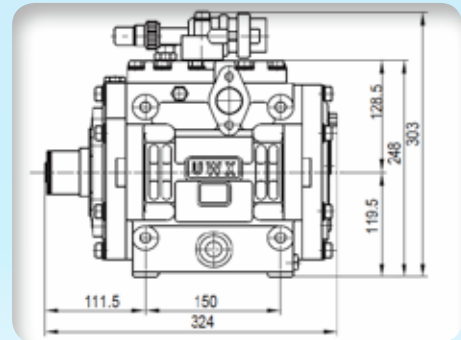
Specifications



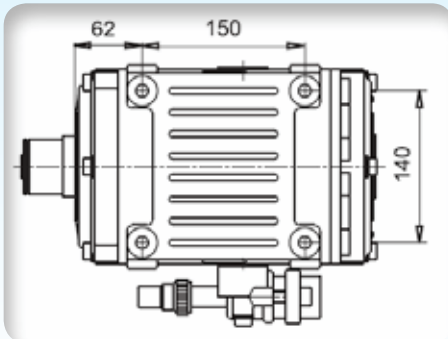
Top view



Rear view



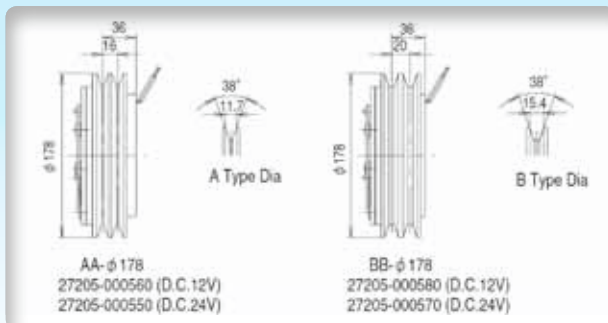
Side view



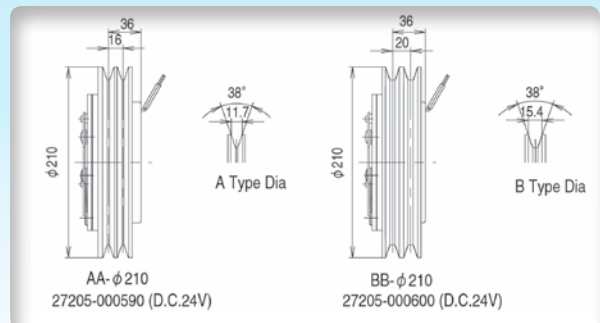
Bottom view

Compressor Model	UWX440	UWX550
Number of cylinders	14	14
Displacement	508 cc/rev	607 cc/rev
Refrigerant	HFC-134a	HFC-134a
Initial oil charge	1000 cc	1000 cc
Oil type	Unidap 7 (PAG oil)	Unidap 7 (PAG oil)
Weight without clutch	24kg	24kg

Magnetic clutch



Diameter 178mm



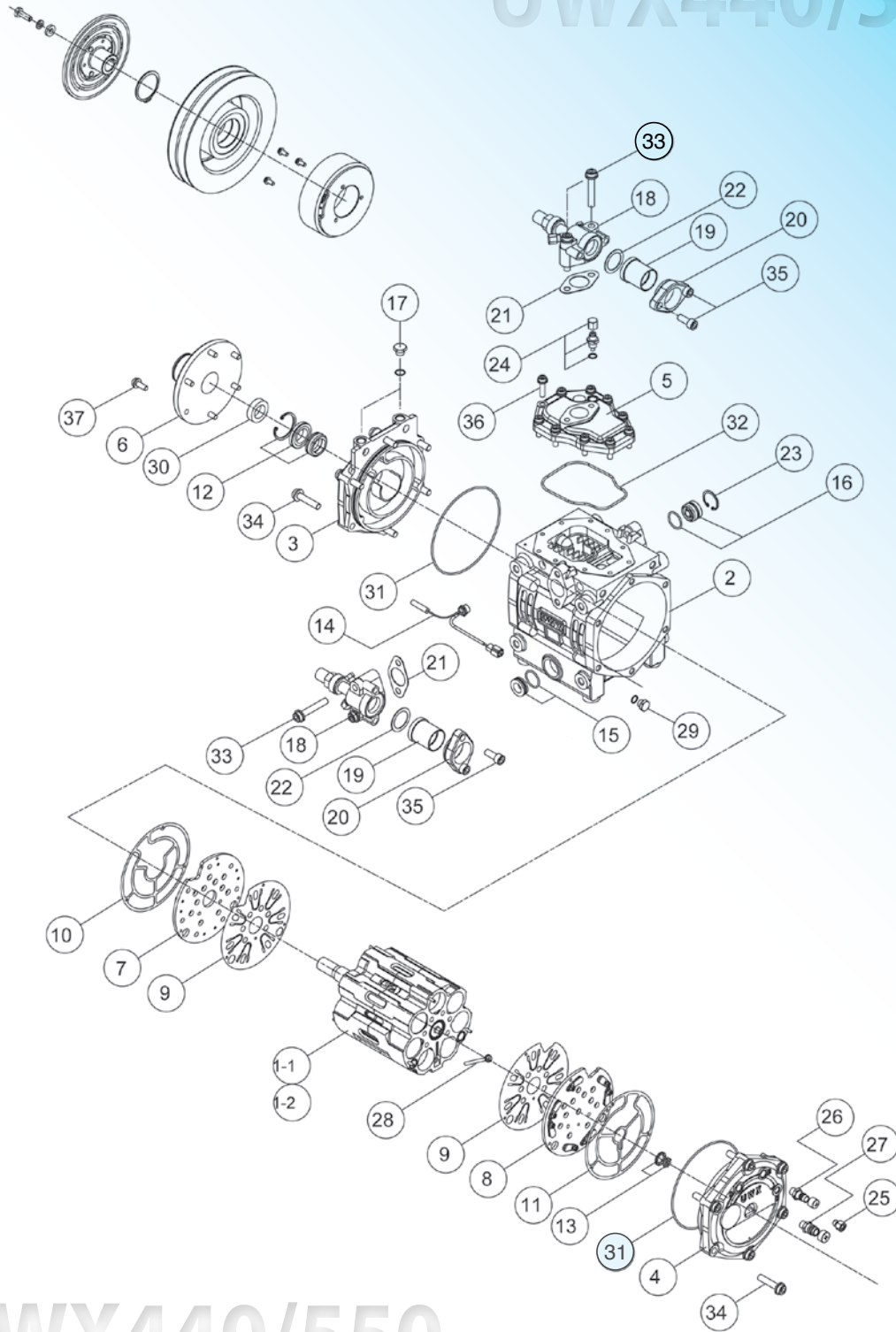
Diameter 210mm

Compressor part numbers

No.	Part number	Description	Qty
1.1	22010-000360	440 working assembly	1
1.2	22010-000370	550 working assembly	1
2	21405-000750	Body	1
3	21510-000040	Front cap	1
4	21505-000250	Rear cap	1
5	21501-000010	Head cover	1
6	21510-000030	Front nose	1
7	22601-000080	Valve plate front assembly	1
8	22601-000090	Valve plate rear assembly	1
9	22602-000260	Valve plate suction	2
10	93204-00090	Gasket front	1
11	93204-000100	Gasket rear	1
12	92503-000110	Mechanical seal assembly	1
13	23101-000010	Gear pump	1
14	53101-000080	Thermal switch	1
15	35801-000010	Sight glass	2
16	13201-000240	Plug	1
17	13201-000230	Plug (M14)	2
18	38101-000040	Shut-off valve	2
19	42203-000200	Copper spigot	2
20	32308-000590	Flange	2
21	93203-000010	Gasket A	2
22	93203-000020	Gasket B	2
23	92404-000040	Snap ring	1
24	42203-000161	Nipple, Oil separator	1
25	38305-000030	Relief valve assembly	1
26	38101-000020	L charge valve	1
27	38101-000030	H charge valve	1
28	42102-000010	Oil pipe	1
29	13201-000010	Plug (M12)	1
30	11950-11000	Felt	1
31	92501-000500	O ring	2
32	92501-000490	O ring	1
33	91913-100604	Bolt (M10 x 60)	4
34	91913-10045	Bolt (M10 x 45)	12
35	91013-10035	Bolt (M10 x 35)	4
36	91913-08030	Bolt (M8 x 30)	10
37	91913-08020	Bolt (M8 x 20)	6

Exploded view

UWX440/550



UWX440/550

Service tool part numbers

No.	Part number	Description
1	03301-004230	Working assembly bench
2	03301-003140	Stand
3	03301-003180	Remover/installer, mechanical seal
4	03301-003190	Installer, ring
5	03301-004950	Shaft rotating handle
6	03301-000490	Guide pin
7	03301-003230	Remover, mechanical seal plate
8	03301-000350	Installer, pulley
9	03301-000370	Clutch wrench
10	03301-012370	Pulley pad
11	03301-010010	Hub remover, clutch
12	03301-000380	Torque wrench
13	03301-000440	14mm socket
14	03301-000450	8mm hexagonal socket
15	03301-000400	Thickness gauge
16	03301-000410	Remover, pulley
17	03301-000390	Plastic hammer
18	03301-000430	Snap ring pliers (<i>Shaft</i>)
19	03301-000420	Snap ring pliers (<i>Hole</i>)
20	03301-000650	6mm hexagonal socket

Bolt torque specifications

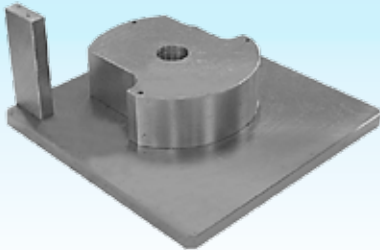
Description	Bolt diameter (mm)	Tightening torque (N•m)
Housing cap bolts	M10	33.3 - 35.3
High/low service valve	M12	10.8 - 12.7
Blind plugs	M8	23.5 - 25.5
Clutch coil bolts	M6	6.9 - 8.8
Armature bolt	M8	18.6 - 20.6

Service tools

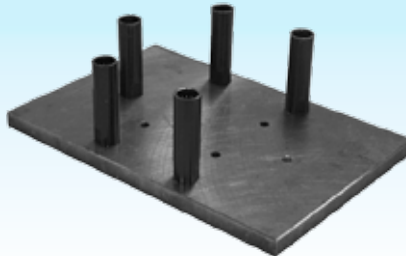
 - *Genuine Unicla tools*

 - *Optional generic tools*

1 03301-004230



2 03301-003140



3 03301-003180



4 03301-003190



5 03301-004950



6 03301-000490



7 03301-003230



8 03301-000350



9 03301-000370



11 03301-010010



10 03301-012370



12 03301-000380



13 03301-000440



14 03301-000450



15 03301-000400



16 03301-000410



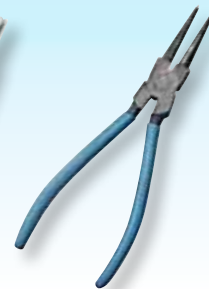
17 03301-000390



18 03301-000430



19 03301-000420



20 03301-000650



Removal of magnetic clutch

I. Removal of armature bolt

Tools required: • Stand • Clutch wrench
• Wrench • 14mm socket

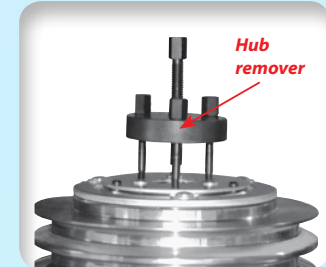
Procedure: Place the compressor on the stand. Hold clutch by inserting the claws of the clutch wrench into the holes on the armature. Remove the centre bolt by using the wrench



II. Removal of armature

Tools required: • Hub remover

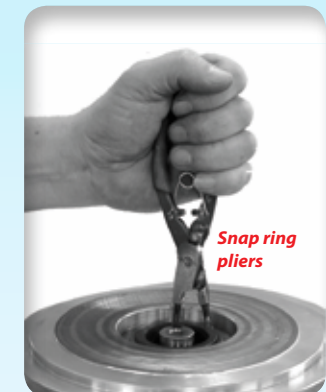
Procedure: Pull the armature upwards



III. Removal of snap ring

Tools required: • Snap ring pliers (*shaft*)

Procedure: Remove the snap ring with the snap ring pliers



IV. Removal of pulley assembly

Tools required: • Remover, pulley • Wrench • Pulley pad

Procedure: Remove the pulley assembly with the remover and pad



V. Removal of coil

Tools required: • Standard screwdriver

Procedure: Remove 3 M6 bolts with screwdriver



VI. Inspection of clutch components

1. Armature - Contact surface must be clean, smooth and unmarked, with no abnormal scoring

2. Pulley - Contact surface must be clean, smooth and unmarked, with no abnormal scoring

3. Coil - Wiring harness must be in good condition



Armature



Pulley



Coil

Installation of magnetic clutch

I. Installation of coil

Tools required: • Stand • Standard screwdriver

Procedure: Tighten 3 bolts (wire must be visible at 1 o'clock position, when viewed from the front)

Tightening torque: $7.8 \pm 1 \text{ N}\cdot\text{m}$

II. Installation of pulley

Tools required: • Pulley installer • Plastic hammer

Procedure: Place the pulley on the nose top and install it by tapping on the installer until it stops. Do not tap if the pulley is not located correctly

III. Installation of clutch key and snap ring

Tools required: • Snap ring pliers (shaft)

Procedure: Install the snap ring into the groove (tapered side up). Install the key in keyway

IV. Installation of shims and armature

Tools required: • Guide pin

Procedure: Install the guide pin into the centre threaded hole of the shaft and select shims ($T=0.1, 0.3$ and 0.5mm) to ensure the clutch clearance

V. Installation of armature

Tools required: • Clutch wrench • Torque wrench
• 14mm Socket

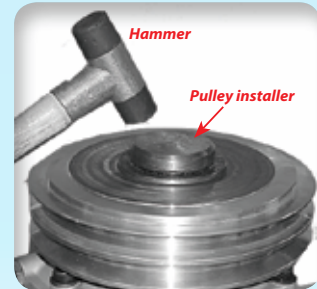
Procedure: Place washers and spring washers on M8 bolt. Hold clutch by inserting the claws of the clutch wrench into the holes on the armature. Tighten the centre bolt by using the wrench

Tightening torque: $19.6 \pm 1 \text{ N}\cdot\text{m}$

VI. Air gap

Tools required: • Thickness gauge

Procedure: Ensure clutch clearance is correct all around ($0.3\text{mm} \leq \text{gap} \leq 0.6\text{mm}$)



Removal of mechanical seal

I. Removal of front nose

Tools required: • 6mm hexagonal socket

Procedure: Remove M8 bolt (6 locations) with socket wrench
Remove key. Tap edge of key with driver or punch

Do not damage shaft

II. Removal of snap ring

Tools required: • Snap ring pliers (hole)

Procedure: Remove the snap ring slowly with pliers as shown

III. Removal of plate ring

Tools required: • Remover, plate ring

Procedure: Hook and remove plate ring with remover as shown, turn around lightly and pull it

IV. Removal of seal

Tools required: • Remover, mechanical seal

Procedure: Push remover lightly. Turn right and hook, then remove upward slowly

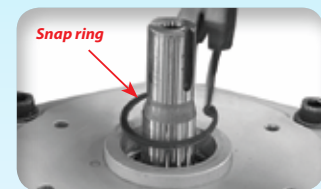
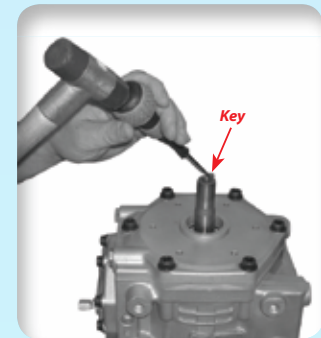
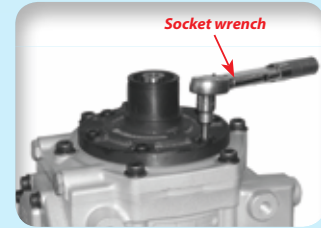
V. Removal of oring

Tools required: • Hook tool

Procedure: Remove oring with hook tool

VI. Inspection of mechanical seal component

Caution - plate ring must be clean and unmarked



Installation of mechanical seal

I. Installation of seal

Tools required: • Installer, seal

Procedure: Install oring. Insert seal until stop point, then turn right. Fix on shaft notch. Place the remover on the seal correctly and press the seal with the remover until it stops

Caution - damage will occur if too much force is used.

Do not touch surface on seal ring

II. Installation of plate ring

Tools required: • Installer, ring

Procedure: Insert ring (moving surface side to be downward) until in stop position

Installation of mechanical seal - *continued*

III. Installation of snap ring

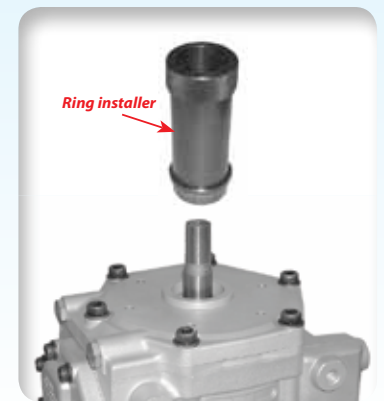
Tools required: • Snap ring pliers (*hole*) • Installer ring

Procedure: Insert the snap ring into nose section (*tapered part of the snap ring must be facing downwards*). Push the snap ring downward with the installer, and fit into groove

IV. Installation of felt seal

Tools required: • Installer ring

Procedure: Install the felt seal into the nose section
Push the felt seal until it touches the snap ring



Disassembly of body

Caution - o ring should not be reused.

I. Removal of oil

Procedure: Remove the drain plug and drain the oil

II. Removal of seal (*Refer to page 9 for instructions*)

III. Removal of bolts on rear cap

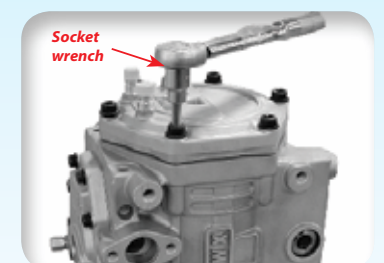
Tools required: • 8mm hexagonal socket • Stand

Procedure: Remove the M10 securing bolts (*6pcs*) from the rear cap

IV. Removal of rear cap

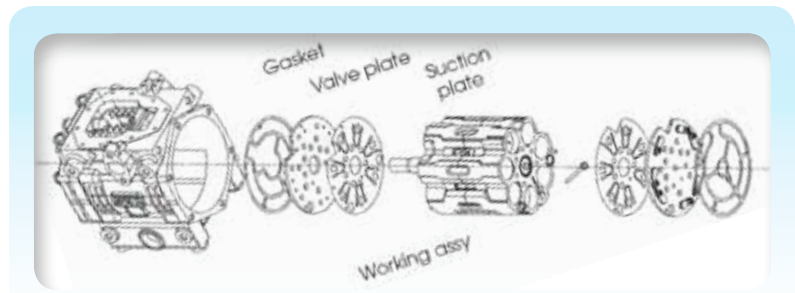
Procedure: Remove the rear cap by gently inserting a screw driver or lever into the recess. Lever all around, not just at one position

Caution - do not damage cap or body.



V. Removal of valves and working assembly

Procedure: Remove rear gasket, valve plate and suction valve. Remove oil pipe first then remove working assembly by pressing the end of the shaft into the front of the body as shown. Remove front gasket, valve and suction valve



VI. Removal of front cap

Tools required: • 8mm hexagonal socket

Procedure: Remove the M10 bolts (6pcs) from the front cap. Remove the front cap by gently inserting a screwdriver or lever into the recess. Lever all around, not just at one position

Caution - do not damage cap or body.



Assembly of body

I. Installation of the oring for front and rear cap

Procedure: The o-ring must be free from marks and dust. Thoroughly lubricate new o-ring properly and insert into the groove. Ensure the o-ring is lying straight in the groove without a twist



II. Installation of the front cap

Tools required: • Torque wrench • 8mm hexagonal socket
Procedure: Place the body with front section facing upward. Place the front cap on the body (*be careful not to twist the oring*). Tighten M10 bolts (6pcs) with torque wrench

Tightening torque: 34.3 ± 1 N•m



III. Installation of the front valve plate and body

Tools required: • Working assembly bench

Procedure: Place the working assembly on locating pins. Stack the suction plate, the valve plate and gasket on locating pins in sequence as shown. Carefully lower the body over the working assembly until it stops next to the working bench guide



Assembly of body - continued

IV. Installation of rear valve plate

Tools required: • Stand

Procedure: Insert vacuum pipe. Place the body in an inverted position on the stand and stack the suction plate, valve plate and gasket as shown, install the gear pump

V. Inspection, tightening and clearance of the rear cap

Tools required: • Torque wrench • 8mm hexagonal socket
• Thickness guage

Procedure: Place the rear cap on the body (*be careful not to twist the oring*). Tension the M10 bolts (6pcs) diagonally, alternately and carefully.

Check the rear cap clearance as specified: $0.4 \leq \text{Gap} \leq 1.2\text{mm}$

Tightening torque: $34.3 \pm 1 \text{ N}\cdot\text{m}$

VI. Installation of mechanical seal

(Refer to page 9)

VII. Installation of front nose and key

Tools required: • Torque wrench • 6mm hexagonal socket

Procedure: Install the key in keyway. Install front nose with M8 bolts (6 pieces). Clutch lead wire groove is located at 1 o'clock position as shown on page 8.

Tightening torque $24.5 \pm 1 \text{ N}\cdot\text{m}$

VIII. Test working assembly rotation

Tools required: • Shaft rotating handle

Procedure: Install the handle into the front section to check the shaft rotates smoothly

IX. Filling compressor oil

Procedure: Fill the following amount of oil into the low pressure port as shown. Ensure drain correctly plugged

Standard oil type: Unidap 7 (PAG) or Unidap 6 (POE)

Amount of oil = $1000 \pm 20\text{cc}$

X. Plug cap on oil port

Tools: • 8mm hexagonal socket

Procedure: Tighten high/low pressure port cap bolts

Tightening torque: $34.3 \pm 1 \text{ N}\cdot\text{m}$



System oil quantity

The correct amount of oil must be maintained in the compressor and system. Long hose runs and dual evaporator systems must have additional oil added to the system. Severe oil starvation problems may result from insufficient system oil being allowed. To determine oil quantity required, Unicla recommends a calculation as a percentage of refrigerant charge as follows:

- **20% for UWX440/550 compressors** in standard applications where the suction and discharge lines are less than 6 metres in length
- **30% for UWX440/550 compressors** in applications where suction and discharge lines exceed 6m in length

Example:

Calculate oil charge as 20% of refrigerant charge, 5 kg charge = 5000 g x 20% = 1000 ml (cc) of oil. If fitting a UP/UX200 compressor, then deduct the compressor initial oil charge to determine amount of oil to be added. Therefore 1000 – 600 = 400cc oil to be added to system

Oil type and grade

Each Unicla UWX compressor is fitted with either PAG oil (*Unidap 7*) or POE oil (*Unidap 6*). When adding oil to the system, Unicla oil must be used. **⚠ Warranty is void if these guidelines are not followed**

Compressor Model	Refrigerant	Oil Type (Unicla)	Viscosity @ 40°C	Viscosity @ 100°C	Application	Low side Saturation	Oil Separator
UWX440/550	R134a	Unidap 7	48.01	10.51	Airconditioning	> 0°C	Optional
UWX440/550	R134a	Unidap 6	65.5	9.3	Airconditioning	>0°C	Optional

The following labels will determine the type of oil in each UWX440/550 compressor:



POE type



PAG type

Storage guidelines

- I. Evacuate compressor for 3 minutes and fill with nitrogen (N₂) at 0.1 ~ 0.2 MPa
- II. Place the compressor in a clean and dry area with low humidity and tag with details
- III. Keep compressor away from direct sunlight
- IV. Store the compressor horizontally on a flat, even surface
- V. Do not store the compressor in temperatures above 30°C
- VI. Place the compressor in a well ventilated area to avoid corrosion damage

*The contents of this manual are subject to change without prior notice



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